WASHINGTON-BALTIMORE REGIONAL AIR PASSENGER

Ground Access Forecast Update

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Aviation Technical Subcommittee
March 28, 2019

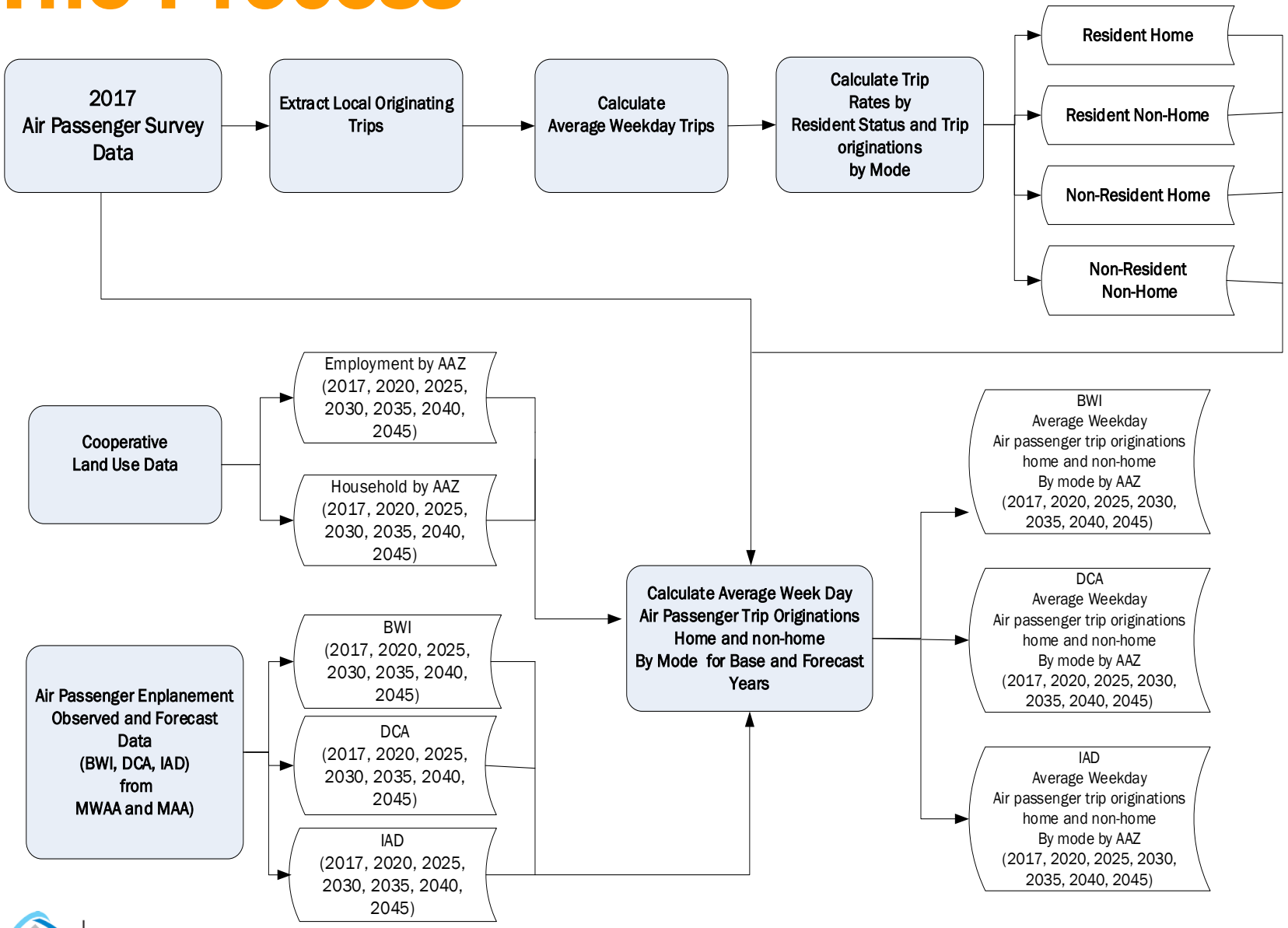
Agenda Item #4

National Capital Region
Transportation Planning Board

Objective

- Develop average weekday base and forecast years of local originating air passenger trips from each Aviation Analysis Zones to the three regional commercial airports - BWI, DCA and IAD - by mode

The Process


2017
Air Passenger Survey
Data
Extract Local Originating
Trips
Calculate
Average Weekday Trips
Calculate Trip
Rates by
Resident Status and Trip
originations
by Mode
Resident Home
Resident Non-Home
Non-Resident Home
Non-Resident
Non-Home
Cooperative
Land Use Data
Employment by AAZ
(2017, 2020, 2025,
2030, 2035, 2040,
2045)
Household by AAZ
(2017, 2020, 2025,
2030, 2035, 2040,
2045)
Air Passenger Enplanement
Observed and Forecast
Data
(BWI, DCA, IAD)
from
MWAA and MAA)
BWI
(2017, 2020, 2025,
2030, 2035, 2040,
2045)
DCA
(2017, 2020, 2025,
2030, 2035, 2040,
2045)
IAD
(2017, 2020, 2025,
2030, 2035, 2040,
2045)
Calculate Average Week Day
Air Passenger Trip Originations
Home and non-home
By Mode for Base and Forecast
Years
BWI
Average Weekday
Air passenger trip originations
home and non-home
By mode by AAZ
(2017, 2020, 2025, 2030,
2035, 2040, 2045)
DCA
Average Weekday
Air passenger trip originations
home and non-home
By mode by AAZ
(2017, 2020, 2025, 2030,
2035, 2040, 2045)
IAD
Average Weekday
Air passenger trip originations
home and non-home
By mode by AAZ
(2017, 2020, 2025, 2030,
2035, 2040, 2045)

Methodology

1. Obtain enplanements forecast from the Federal Aviation Administration for BWI, DCA and IAD for forecast years 2018 to 2045

A. Baltimore/Washington International Thurgood Marshall (BWI)

Year	Enplanements	Change	
		No.	%
2015	11,934,215 [1]		
2017	13,214,636 [1]	1,280,421	5.36%
2020	14,206,605 [2]	991,969	2.50%
2025	15,533,893 [2]	1,327,288	1.87%
2030	16,947,302 [2]	1,413,409	1.82%
2035	18,426,041 [2]	1,478,739	1.75%
2040	19,995,765 [2]	1,569,724	1.70%
2045	21,650,495 [2]	1,654,730	1.66%

[1] *MAA Observed*

[2] *Forecast based on FAA TAF Fiscal Year annual percent increase*

B. Ronald Reagan Washington National (DCA)

Year	Enplanements	Change	Change
2015	11,495,937 [1]		
2017	11,956,974 [1]	461,037	2.01%
2020	12,631,321 [2]	674,347	1.88%
2025	14,117,035 [2]	1,485,714	2.35%
2030	14,695,369 [2]	578,334	0.82%
2035	15,099,624 [2]	404,255	0.55%
2040	15,462,749 [2]	363,125	0.48%
2045	15,810,480 [2]	347,731	0.45%

[1] *MWAA Observed*

[2] *Forecast based on FAA TAF Fiscal Year annual percent increase*

C. Washington Dulles International (IAD)

Year	Enplanements	Change	Change
2015	10,712,394 [1]	10,712,394	
2017	11,307,077 [1]	594,683	2.78%
2020	11,809,563 [2]	502,486	1.48%
2025	13,167,927 [2]	1,358,364	2.30%
2030	14,606,113 [2]	1,438,186	2.18%
2035	16,096,973 [2]	1,490,860	2.04%
2040	17,649,702 [2]	1,552,729	1.93%
2045	19,256,398 [2]	1,606,696	1.82%

[1] *MWAA Observed*

[2] *Forecast based on FAA TAF Fiscal Year annual percent increase*

Methodology

2. Obtain land use forecast of household and employment base year 2017 and forecast years to 2045 for the Washington/Baltimore Air System Planning Region

3. Summarize Household and Employment data from 4,374 TAZ to 161 AAZ

Household Forecast

Year	Household	Change	Percent Growth	
2017	3,233,842	-		
2020	3,378,582	204,707	2017 - 2020	6.3%
2025	3,558,288	189,412	2020 - 2025	5.6%
2030	3,726,321	175,637	2025 - 2030	4.9%
2035	3,868,989	146,832	2030 - 2035	3.9%
2040	3,993,753	127,234	2035 - 2040	3.3%
2045	4,019,030	111,509	2040 - 2045	2.8%

Source:- MWCOG Round 9.1 Cooperative Forecast and BMC 8B Landuse Data

Emplyment Forecast

Year	Employment	Change	Percent Growth	
2017	4,959,560	-		
2020	5,197,073	320,755	2017 - 2020	6.5%
2025	5,491,831	386,329	2020 - 2025	7.4%
2030	5,767,066	331,716	2025 - 2030	6.0%
2035	6,007,295	279,069	2030 - 2035	4.8%
2040	6,251,041	222,967	2035 - 2040	3.7%
2045	6,169,622	212,234	2040 - 2045	3.4%

Source:- MWCOG Round 9.1 Cooperative Forecast and BMC 8B Landuse Data

Note: For regional transportation planning purposes, CTPP-based adjustments were applied to employment forecasts in selected non-MWCOG jurisdictions to account for definitional differences in employment.

4. Review 2017 Regional Air Passenger Survey Data

A. Adjust survey weight to annual passenger for 2017

B. Select local originating passenger trips

Annual Trip Originations by Airport (in Thousands)

Enplanement Type		Airport BWI	DCA	IAD	Total
Local origination	*Number*	8,911	10,499	7,245	26,655
- (Came by ground transportation)	*Percent*	67%	88%	64%	73%
Connected from another Flight	*Number*	4,305	1,458	4,062	9,826
- (Local and/or International)	*Percent*	33%	12%	36%	27%
Total Annual Enplanements	*Number*	13,216	11,957	11,307	36,480
	Percent	100%	100%	100%	100%
Percent of Air System Planning Region		36%	33%	31%	

Source:- 2017 Washington-Baltimore Regional Air Passenger Survey

C. Select trips originating within the Washington / Baltimore Air System Planning Area

Internal/External Trip Originations by Airport

Enplanement Type		Airport BWI	DCA	IAD	Total
Within Air System Planning Region	*Number*	7,723	10,281	6,730	24,734
- *(Internals)*	*Percent*	87%	98%	93%	93%
Outside Air System Planning Region	*Number*	1,188	218	514	1,920
- *(Externals)*	*Percent*	13%	2%	7%	7%
Total Annual Enplanements	*Number*	**8,911**	**10,499**	**7,245**	**26,655**
	Percent	**100%**	**100%**	**100%**	**100%**

- ***Internal*** originating trips are local originating trips within the Washington/Baltimore Air System Planning Area.
- ***External*** originating trips are trips originating from PA, DE, WV, NJ or external VA and MD

Source:- 2017 Washington-Baltimore Regional Air Passenger Survey

Calculate Forecast Years: Local & Internal AAZ Trips

Local Originating Trips

Year	BWI	DCA	IAD	Total
2017	8,910	10,499	7,245	26,654
2020	9,579	11,091	7,567	28,237
2025	10,474	12,395	8,437	31,306
2030	11,427	12,903	9,359	33,689
2035	12,424	13,258	10,314	35,996
2040	13,482	13,577	11,309	38,368
2045	14,598	13,882	12,338	40,818

Internal AAZ Originating Trips

BWI	DCA	IAD	Total
7,752	10,289	6,738	24,778
8,334	10,869	7,037	26,240
9,112	12,147	7,846	29,106
9,941	12,645	8,703	31,290
10,809	12,993	9,592	33,394
11,730	13,305	10,517	35,552
12,700	13,605	11,474	37,779

Note:-

- Local originating trips are departing passengers who's trip starts from one of the region's three airports.
- Internal AAZ originating trips are local originating trips within the Washington/Baltimore Air System Planning Area.
- Local originating trips are calculated based on the 2017 Air Passenger Survey data to be 67% for BWI, 88% for DCA and 64% for IAD, of the total enplanements, shown on Tables 3, 4 and 5, respectively.
- Internal originating trips are calculated based on the 2017 Air Passenger Survey data to be 87% for BWI, 98% for DCA, and 93% for IAD, of the total local originating trips, that are within the 161 internal AAZ's.
- These data does not include external zones for PA, DE, WV, NJ or external VA and MD

- Local originating trips are departing passengers whose trip starts from one of the region's three airports.

- Internal AAZ originating trips are local originating trips within the Air System Planning Area

- Local originating trips are calculated based on the 2017 Air Passenger Survey data to be 67% for BWI, 88% for DCA and 64% for IAD, of the total enplanements

- Internal originating trips are calculated based on the 2017 Air Passenger Survey data (87% for BWI, 98% for DCA, 93% for IAD) of the total local originating trips, that are within the 161 internal AAZ's

- These data does not include external zones for PA, DE, WV, NJ or external VA and MD

D. Calculate Average week day enplanements by airport

Forecast Year	Airports BWI	DCA	IAD	Total
2017	22,394	28,261	18,703	69,358
2020	24,077	29,847	19,526	73,450
2025	26,298	33,360	21,777	81,435
2030	28,709	34,719	24,152	87,580
2035	31,216	35,679	26,620	93,515
2040	33,865	36,542	29,181	99,588
2045	36,659	37,357	31,848	105,864

Note:- Totals may not add due to rounding

E. Summarize local originating trips resident/non-resident and Home and Non-Home originations by airport

BWI					
Year	Resident		Non-Resident		Total
	Home-based	Non-Home Based	Home-based	Non-Home Based	
2017	10,291	1,214	5,135	5,754	**22,394**
2020	11,022	1,321	5,539	6,195	**24,077**
2025	11,993	1,473	6,045	6,787	**26,298**
2030	13,058	1,619	6,601	7,431	**28,709**
2035	14,122	1,777	7,159	8,158	**31,216**
2040	15,204	1,950	7,725	8,986	**33,865**
2045	16,289	2,072	8,379	9,919	**36,659**

DCA					
Year	Resident		Non-Resident		Total
	Home-based	Non-Home Based	Home-based	Non-Home Based	
2017	9,236	1,542	4,360	13,123	**28,261**
2020	9,740	1,598	4,597	13,912	**29,847**
2025	10,829	1,756	5,133	15,642	**33,360**
2030	11,277	1,810	5,335	16,297	**34,719**
2035	11,619	1,853	5,489	16,718	**35,679**
2040	11,905	1,891	5,616	17,130	**36,542**
2045	12,216	1,917	5,761	17,463	**37,357**

IAD					
Year	Resident		Non-Resident		Total
	Home-based	Non-Home Based	Home-based	Non-Home Based	
2017	8,592	1,321	3,583	5,207	**18,703**
2020	8,958	1,396	3,708	5,464	**19,526**
2025	9,976	1,563	4,096	6,142	**21,777**
2030	11,034	1,744	4,520	6,854	**24,152**
2035	12,160	1,927	4,965	7,568	**26,620**
2040	13,272	2,128	5,438	8,343	**29,181**
2045	14,433	2,343	5,915	9,157	**31,848**

F. Calculate trip rates by airport

1. Resident Home Based Trips

$$\frac{AAZ_X \text{ Resident Origin Home Trips } (2017)}{AAZ_X \text{ Number of Household } (2017)}$$

2. Resident Non-Home Based Trips

$$\frac{AAZ_X \text{ Resident Origin Non-Home Trips } (2017)}{AAZ_X \text{ Number of Employment } (2017)}$$

3. Non-Resident Home Based Trips

$$\frac{AAZ_X \text{ Non-Resident Origin Home Trips } (2017)}{AAZ_X \text{ Number of Household } (2017)}$$

2. Non-Resident Non-Home Based Trips

$$\frac{AAZ_X \text{ Non-Resident Origin Non-Home Trips } (2017)}{AAZ_X \text{ Number of Employment } (2017)}$$

Trip Rates

Airport	Resident		Non-Resident	
	Home	Non-Home	Home	Non-Home
BWI	0.57120	0.06584	0.29415	0.32320
DCA	0.52603	0.04063	0.26401	0.46928
IAD	0.42882	0.03217	0.25624	0.12442

G. Calculate trip mode share

Home and Non-Home

1. Auto Driver
2. Auto Passenger
3. Transit Passenger
4. Airport Transit Passenger
5. Other mode Passenger

H. Calculate trip Time-of-Day Split

One-Hour before flight time

1. AM trips = flight time 700 - 1000 (7:00 AM - 10:00 AM)
2. PM trips = flight time 1600 - 1900 (4:00 PM - 7:00 PM)
3. Off-Peak trips = flight time 600 - 700, 1000 - 1600, 1900 - 2400 (6:00 - 7:00 AM, 10:00 AM - 4:00 PM, 7:00 - 12:00 PM)

Two-Hour before flight time

1. AM trips = flight time 600 - 900 (6:00 AM - 9:00 AM).
2. PM trips = flight time 1500 - 1800 (3:00 PM - 6:00 PM)
3. Off-Peak trips = flight time 900 - 1500, 1800 - 2400 (9:00 AM - 3:00 PM, 6:00 - 12:00 PM).

Average Weekday Air Passenger Gropund Access Trips by Time-of-Day by Airport

Time Period	One-Houre Before Flight Departure BWI	DCA	IAD	Total	Two-Houre Before Flight Departure BWI	DCA	IAD	Total
AM-Peak	4,940	5,686	2,873	**13,500**	5,150	4,760	3,354	**13,264**
	22%	20%	15%	19%	23%	17%	18%	19%
PM-Peak	4,390	4,978	6,379	**15,747**	4,920	4,218	6,054	**15,192**
	20%	18%	34%	23%	22%	15%	32%	22%
Off-Peak	13,059	17,589	9,443	**40,091**	12,319	19,276	9,287	**40,882**
	58%	62%	51%	58%	55%	68%	50%	59%
Total	**22,390**	**28,254**	**18,695**	**69,338**	**22,390**	**28,254**	**18,695**	**69,338**
	100%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note:- Totals may not add due to rounding

Source:- 2017 Washington-Baltimore Regional Air Passenger Survey

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